

1. A silane abatement system comprising:

a water-filled chamber within an outer chamber;

an air intake in one upper portion of said
outer chamber;

5 an exhaust output in another upper portion of
said outer chamber;

a silane gas intake pipe running into said outer
chamber and having its output under water in said water-
filled chamber; and

10 a drain connected through a valve at a bottom
portion of said water-filled chamber.

2. The silane abatement system according to Claim 1
wherein said output of said silane gas intake pipe is
into a C-shaped stainless steel pipe having upwardly
opening flippers whereby silane gas is released into
water within said water-filled chamber.

3. The silane abatement system according to Claim 1
wherein said air intake and said exhaust output both
comprise inwardly opening flippers.

4. The silane abatement system according to Claim 1
further comprising an overflow drain at a bottom portion
of said outer chamber.

5. The silane abatement system according to Claim 1 further comprising:

a water supply pipe connected to said water-filled chamber;

a water level sensor connected to said water-filled chamber; and

a water temperature sensor connected to said water-filled chamber.

6. The silane abatement system according to Claim 5 further comprising a controller that controls said water supply and monitors said water level sensor and said water temperature sensor.

7. The silane abatement system according to Claim 6 wherein in the event that said controller detects an unacceptable condition from either of said water level sensor or said water temperature sensor, said air intake and said exhaust output are closed, and residue waste silane gas within said silane gas intake pipe is pumped into said water-filled chamber.

8. The silane abatement system according to Claim 1 further comprising:

an exhaust pipe exiting said outer chamber through

said exhaust output;

an exhaust temperature sensor connected to said exhaust pipe; and

a fusible link within said exhaust pipe.

9. The silane abatement system according to Claim 8 wherein in the event that an unacceptable condition is detected in either of said exhaust temperature sensor or said fusible link, said air intake and said exhaust output are closed, and residue waste silane gas within said silane gas intake pipe is pumped into said water-filled chamber.

10. The silane abatement system according to Claim 1 further comprising a high pressure pump connected to said silane gas intake pipe.

11. The silane abatement system according to Claim 10 wherein said high pressure pump provides N_2 gas for pushing silane gas through said gas intake pipe into said water-filled chamber.

12. The silane abatement system according to Claim 1 further comprising a fusible link within said high pressure pump.

13. The silane abatement system according to Claim 1 further comprising water sprinklers on an upper portion of said outer chamber and over said water-filled chamber.

14. The silane abatement system according to Claim 1 further comprising water sprinklers on surfaces of said exhaust pipe.

15. The silane abatement system according to Claim 1 wherein waste silane gas is abated by:

bubbling silane gas through said silane gas intake pipe and into said water-filled chamber;

5 reacting said silane gas with oxygen dissolved in water in said water-filled chamber whereby SiO_2 precipitates are formed and wherein said SiO_2 precipitates settle to a bottom surface of said water-filled chamber; and

10 opening said valve to drain said SiO_2 precipitates out of said water-filled chamber through said drain.

16. A silane abatement process comprising:

bubbling waste silane gas into a water-filled chamber;

reacting said waste silane gas with oxygen

5 dissolved in water in said water-filled chamber whereby
SiO₂ precipitates are formed and wherein said SiO₂
precipitates settle to a bottom surface of said water-
filled chamber; and

draining said SiO₂ precipitates out of said water-
10 filled chamber.

17. The process according to Claim 16 further comprising
flowing N₂ gas at high pressure to push said waste
silane gas into said water-filled chamber.

18. A silane abatement system comprising:

a water-filled chamber within an outer chamber;
an air intake in one upper portion of said outer
chamber;

5 an exhaust output in another upper portion of said
outer chamber connecting to an exhaust pipe;

water sprinklers on an upper portion of said outer
chamber and over said water-filled chamber and on
surfaces of said exhaust pipe;

10 a silane gas intake pipe running into said outer
chamber and having its output under water in said water-
filled chamber; and

a drain connected through a valve at a bottom
portion of said water-filled chamber.

19. The silane abatement system according to Claim 18 wherein said output of said silane gas intake pipe is into a C-shaped stainless steel pipe having upwardly opening flippers whereby silane gas is released into water within said water-filled chamber.

20. The silane abatement system according to Claim 18 wherein said air intake and said exhaust output both comprise inwardly opening flippers.

21. The silane abatement system according to Claim 18 further comprising an overflow drain at a bottom portion of said outer chamber.

22. The silane abatement system according to Claim 18 further comprising:

a water supply pipe connected to said water-filled chamber;

5 a water level sensor connected to said water-filled chamber;

a water temperature sensor connected to said water-filled chamber;

10 an exhaust temperature sensor connected to said exhaust pipe;

a fusible link within said exhaust pipe; and

a controller that controls said water supply and monitors said water level sensor, said water temperature sensor, said exhaust temperature sensor, and said
 15 fusible link.

23. The silane abatement system according to Claim 18 further comprising a high pressure pump connected to said silane gas intake pipe having a fusible link within said high pressure pump.

24. The silane abatement system according to Claim 18 wherein waste silane gas is abated by:

bubbling silane gas through said silane gas intake pipe and into said water-filled chamber;

5 reacting said silane gas with oxygen in water in said water-filled chamber whereby SiO_2 precipitates are formed and wherein said SiO_2 precipitates settle to a bottom surface of said water-filled chamber; and

opening said valve to drain said SiO_2 precipitates
 10 out of said water-filled chamber through said drain.

25. The silane abatement system according to Claim 22 wherein in the event that said controller detects an unacceptable condition from any of said water level sensor, said water temperature sensor, said exhaust

temperature sensor, or said fusible link, said water sprinklers are triggered, said air intake and exhaust flippers are closed, and residue waste silane gas within said silane gas intake pipe is pumped into said water-filled chamber.

2025-11-25 14:25:50